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# A review of the *Polyrhachis cryptoceroides* species-group with description of a new species from Thailand (Hymenoptera: Formicidae)

Rudolf J. KOHOUT

**Abstract**

A new species of the *Polyrhachis cryptoceroides* species-group, *P. thailandica* sp.n. from Thailand, is described. The three previously described species of the group are reviewed. An identification key to workers of the group is given and all four species are illustrated.

**Key words:** Formicidae, *Polyrhachis*, *Myrmhopla*, *P. cryptoceroides* group, Thailand, new species.

*Dr. Rudolf J. Kohout, Biodiversity Program, Queensland Museum, PO Box 3300, South Brisbane, QLD, 4101, Australia. E-mail: kohout@powerup.com.au*

## Introduction

The *Polyrhachis cryptoceroides* species-group was established by EMERY (1925:190) for three closely allied species within the subgenus *Myrmhopla* FOREL: *P. cryptoceroides* EMERY, 1887, *P. jerdonii* FOREL, 1892, and *P. wroughtonii* FOREL, 1894. DOROW (1995: 51) included *P.* (*Aulacomyrma*) *mystica* KARAWAJEW, 1927 in the group, but as a junior synonym of *P. cryptoceroides*. Thus, the new species described here, *P. thailandica* sp.n., raises the number of species comprising this small group to four. All appear to be rare and seldom collected and, except for *P. cryptoceroides*, they are manifestly absent from the majority of the collections examined. All appear to be restricted to primary forests where they build rather small nests of silk and vegetation debris under the bark of living trees (DOROW 1995: 51).

## Methods

Photographs of the specimens were taken with a Nikon Digital Sight Camera System attached to Leica MZ16A stereomicroscope. Images were processed using Combine Z5 software and Photoshop CS2 (Adobe Systems Inc., USA). All photographs are of primary types.

References and synonyms of individual species are listed only where relevant to the context of this paper. For full synonymy citations see BOLTON (1995) and DOROW (1995). Publication dates and the spelling of species epithets and authors names follow BOLTON (1995), except for W. KARAWAJEW, where the original spelling of that author's name is followed.

Standard Measurements and Indices:

TL Total length: necessarily composite measurement of outstretched length of entire ant measured in profile.

HL Head length: maximum measurable length of head in perfect full face view, measured from anteriormost point of clypeal border or teeth, to posteriormost point of preoccipital margin.

HW Head width: width of head in perfect full face view, measured immediately in front of eyes.

CI Cephalic index: HW × 100 / HL.

SL Scape length: excluding the condyle.

SI Scape index: SL × 100 / HW.

PW Pronotal width: maximum width of pronotal dorsum excluding spines.

MTL Metathoracic tibial length: maximum measurable length of tibia of hind leg.

Measurements were taken using a Zeiss SR stereomicroscope at 32× magnification with an eyepiece graticule calibrated against a stage micrometer. All measurements are in millimetres (mm).

Abbreviations used for specimen data are: Distr. = District; FR = Forest Reserve; NP = National Park; Prov. = Province; R. = River; rf. = rainforest; WS = Wildlife Sanctuary.

Abbreviations of institutions (with names of cooperating curators):

AMKU Ant Museum of the Faculty of Forestry, Kasetsart University, Bangkok, Thailand (Dr. D. Wiwatwitaya)

IZAS Institute of Zoology, Ukrainian Academy of Sciences, Kiev, Ukraine (Dr. A.G. Radchenko)

MCSN Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy (Drs. R. Poggi, V. Raineri)

MHNG Muséum d'Histoire Naturelle, Geneva, Switzerland (Drs. C. Besuchet, I. Löbl, B. Merz)

MCZC Museum of Comparative Zoology, Harvard University, Cambridge, Mass., USA (Dr. S.P. Cover)

PSUT Prince of Songkla University, Hat Yai, Songkhla Prov., Thailand (Drs. S. Watanasit, Nawee Noon-anant)

QMBA Queensland Museum, Brisbane, Australia (Drs. C.J. Burwell, G.B. Monteith)

RMNH Nationaal Natuurhistorisch Museum, Leiden, The Netherlands (Dr. Ing. C. van Achterberg)

## Systematics

### Diagnosis of the group

**Worker.** Small ants (HL < 1.45) with general characteristics of the genus. Anterior clypeal margin deeply incised medially as in *P. cryptoceroides*, or produced into shallow, medially notched flange. Sides of head with distinct longitudinal carina, dividing gena from ventral parts of head. Dorsum of mesosoma marginate laterally for most of its length, or immarginate as in *P. wroughtonii*,

strongly converging posteriorly. Armament of body well developed with broadly-based pronotal spines and slender, widely diverging propodeal spines; petiole with spines evenly curved, embracing base of first gastral segment, and a pair of short intercalary teeth. Base of first gastral segment concave with anterodorsal margin forming acute ridge. Sculpturation of head and body consisting of relatively fine (*P. jerdonii*) to rather coarse (*P. thailandica*) reticulate-punctation, with gastral sculpturation generally more modest and finer. Pilosity greatly reduced, with only short erect hairs over front of head and medium length hairs around apex and ventral segments of gaster.

**Queen.** Very much like worker with characters identifying full sexuality, including three ocelli and complete thoracic structure with wings. Armament of pronotal humeri and propodeum somewhat reduced; lateral petiolar spines distinctly shorter. Sculpturation and pilosity very much as in workers.

**Distribution.** Sri Lanka, India, Indonesia, Malaysia, Thailand, Philippines.

**Key to workers of *P. cryptoceroides* group**

1 Virtually unicoloured; body black, appendages black or dark reddish-brown; anterior clypeal margin deeply emarginate medially (Fig. 9) (Thailand, Malaysia, Indonesia, Brunei, Philippines). ... ..... *P. cryptoceroides*

– Distinctly bicoloured; body black, appendages yellow to light reddish-brown; anterior clypeal margin with truncate, medially notched flange, flanked by distinct angles or acute denticles (Figs. 10 - 12). ..... 2

2 Lateral margins of mesosoma distinct for most of their length; metanotal groove weakly indicated. ..... 3

– Lateral margins of mesosoma indistinct; metanotal groove lacking (India). ..... *P. wroughtonii*

3 Head and mesosoma finely reticulate-punctate; clypeus smoothly rounded, without distinct median carina (Sri Lanka). ..... *P. jerdonii*

– Head and mesosoma coarsely reticulate-punctate; clypeus with strongly raised median carina (Thailand). ..... *P. thailandica* sp.n.

***Polyrhachis cryptoceroides* EMERY, 1887** (Figs. 1, 5, 9)

*Polyrhachis cryptoceroides* EMERY, 1887: 228, pl. 3, fig. 14. Syntype workers. Type locality: Indonesia, Sulawesi, Macassar (O. Beccari), MCSN (examined).

*Polyrhachis (Aulacomyrma) mystica* KARAWAJEW, 1927: 41, fig. 19. Syntype workers, queens, males. Type locality: Indonesia, Java, Buitenzorg (= Bogor) (W. Karawajew #2323), IZAS, QMBA (examined).

*Polyrhachis (Aulacomyrma) mystica* KARAWAJEW: DOROW, 1995: 51. Combination in *P. (Myrmhopla)*. Junior synonym of *P. cryptoceroides*.

**Dimensions of *P. cryptoceroides* syntype:** TL c. 6.00; HL 1.43; HW 1.51; CI 105; SL 1.40; SI 93; PW 1.68; MTL 1.62 (1 measured).

**Dimensions of *P. mystica* syntypes** (workers cited first, queen last): TL c. 5.43, 7.36; HL 1.31, 1.31, 1.68; HW 1.31, 1.28, 1.72; CI 100, 98, 102; SL 1.31, 1.25, 1.65; SI 100, 98, 96; PW 1.40, 1.40, 1.76; MTL 1.50, 1.47, 1.96 (2 workers and 1 alate queen measured).

**Additional material examined:** Philippines: Luzon, Ilocos Norte, Dongon Bangui, 21.V.1913, leg. C.S. Banks (☿); Palawan, Aborian, 4.VI.1982, leg. C.K. Starr (☿); Balabac, 26.V.1982, leg. C.K. Starr (☿). Mindanao, Misamis, Gingoog, Anakan Lbr. Co., leg. A. Reyes (☿). Thailand (S): Prachuab Khiri Khan Prov., Sai Khu Waterfall, 130 - 200 m, 7.III. 2006, leg. N. Naw (☿). East Malaysia: Sabah, Poring Hot Springs, fogging (no date), leg. A. Floren (☿); Danum Valley, 150 m, fogging, 19.-26.I. 2002, leg. E. Widodo & Y. Morimoto (☿); Forest Camp, 19 km N of Kalabakan, 180 m, 22.X.1962, leg. Y. Hirashima (☿); ditto, 60 m, 19.XI.1962, leg. K.J. Kuncheria (☿). West Malaysia: Selangor, Gombak FR, 26.XI.1961, leg. H.E. McClure (☿); Negeri Sembilan, Pasoh FR, XI. 1994, fogging, leg. M. Brendell, K. Jackson & S. Lewis (☿). Brunei: Belait Distr., Ulu Belait, 12.-15.VII.1994, leg. R.J. Kohout, acc. 94.108 (☿). Indonesia: Sulawesi Utara, Dumoga-Bone NP, Maze Toraut R. (0° 34' N, 123° 54' E), c. 220 m, 1.-9.XI.1985, Malaise trap, leg. C. van Achterberg (☿). Java, Bogor (= Buitenzorg) (no further data), leg. N. Gist Gee (☿); Bogor, 20.X.1973, leg. B. Bolton (☿); Kebun Raya, Bogor, 7.III.1997, leg. Sk. Yamane #JA97-SKY-01 (☿).

**Dimensions:** TL c. 4.84 - 5.59; HL 1.15 - 1.40; HW 1.18 - 1.40; CI 98 - 105; SL 1.12 - 1.37; SI 88 - 102; PW 1.25 - 1.75; MTL 1.22 - 1.53 (14 workers measured).

**Remarks:** A widespread and rather variable species that seems to form numerous local populations that show slight morphological differences. When specimens from across the whole range of its distribution are compared these morphological differences intergrade and I prefer to consider all of the examined populations conspecific. The workers of *P. cryptoceroides* superficially resemble those of *Cataulacus* and they are often seen foraging together on the trunks of rainforest trees.

***Polyrhachis jerdonii* FOREL, 1892** (Figs. 2, 6, 10)

*Polyrhachis jerdonii* FOREL, 1892: 17 (footnote). Syntype workers. Type locality: Sri Lanka (Yerbury), MHNG (examined).

*Polyrhachis jerdonii*: FOREL 1893: 17. Description of queen.

**Dimensions of syntypes:** TL c. 4.94 - 5.29; HL 1.25 - 1.31; HW 1.26 - 1.37; CI 101 - 104; SL 1.22 - 1.25; SI 91 - 97; PW 1.18 - 1.31; MTL 1.31 - 1.40 (3 workers measured).

**Additional material examined:** Sri Lanka: (as Ceylon), 92-128 (no further data) (☿); (as Ceylon) (no furter data) (leg. G.B. King) (☿, ♀).

**Dimensions:** TL c. 5.09; HL 1.28; HW 1.29; CI 101; SL 1.22; SI 94; PW 1.22; MTL 1.34 (1 worker measured).

**Remarks:** *Polyrhachis jerdonii* is known only from a few isolated collections from Sri Lanka. It is most similar to *P. thailandica* sp.n., described below. Both have a laterally marginate mesosoma and a weakly indicated metanotal groove. They differ in the general sculpturation of the body that, in *P. jerdonii*, is very finely reticulate-punctate, while it is distinctly more coarsely sculptured in *P. thailandica* sp.n.

***Polyrhachis thailandica* sp.n.** (Figs. 3, 7, 11)

**Material examined:** Holotype: W. Thailand, Kanchanaburi Prov., Maeklong Watershed, 14º 34' N, 98º 50' E,

Figs. 1 - 4: Dorsal view of mesosoma and petiole; (1) *P. cryptoceroides* EMERY, 1887; (2) *P. jerdonii* FOREL, 1892; (3) *P. thailandica* sp.n.; (4) *P. wroughtonii* FOREL, 1894.

30.XI.2003, leg. Nawee Noon-anant (worker). Paratype: N.E. Thailand, Chaiyapum Prov., Phu Kieo WS, 16.IX. 1998, leg. Decha Wiwatwitaya (worker). Type distribution: holotype in AMKU; paratype in QMBA.

**Dimensions of worker** (holotype cited first): TL c. 5.34, 5.54; HL 1.37, 1.37; HW 1.28, 1.28; CI 93, 93; SL 1.34, 1.34; SI 105, 105; PW 1.40, 1.40; MTL 1.56, 1.50 (2 measured).

**Description of worker:** Mandible with 5 teeth, apical tooth largest with others virtually subequal. Clypeus shallowly, but distinctly concave just behind anterior margin, with strongly raised, median, longitudinal carina; anterior clypeal margin produced into medially incised, laterally rounded flange; basal margin indistinct, obscured by overlying sculpturation. Frontal triangle indistinct. Frontal carinae sinuate with margins distinctly raised medially; central area relatively wide with weakly impressed frontal furrow. Sides of head with distinct longitudinal carina running from occiput towards mandibular bases; in full face view, sides of head in front of eyes strongly converging toward mandibular bases in almost straight line; behind eyes sides narrowly rounding into weakly convex occipital margin. Eyes moderately convex, in full face view not or only marginally reaching lateral cephalic outline. Ocelli lacking. Mesosomal dorsum in profile with pronotum convex anteriorly, mesonotum and propodeum rather flat. Pronotal humeri produced into widely based, anteriorly directed, blunt spines; lateral pronotal margins converging posteriorly; promesonotal suture distinct, flat. Mesonotal dorsum with lateral margins rounded anteriorly, strongly converging posteriorly; metanotal groove weakly indicated. Propodeal dorsum armed with pair of slender, acute, widely diverging spines; inner margins of spines continued medially for some distance but failing to meet, leaving gap through which propodeal dorsum descends into oblique declivity. Petiole with anterior face straight, posterior face convex, almost inflated at base; dorsum armed with pair of curved spines that embrace base of first gastral segment, and pair of short intercalary teeth; teeth joined by distinct, acute ridge, forming, in dorsal view, a clearly defined inverted "v"; ridge continued laterally along dorsal face of spines. Subpetiolar process narrow, bluntly angulate anteriorly and posteriorly, shallowly concave medially. First gastral segment with anterior face concave and anterodorsal margin forming acute ridge.

Mandibles finely reticulate with numerous piliferous pits. Dorsum of head and mesosoma, including pronotal spines, very coarsely reticulate-punctate; sculpturation on petiole distinctly weaker. Propodeal and petiolar spines finely reticulate; gaster shagreened.

Figs. 5 - 8: Lateral view of mesosoma and petiole; (5) *P. cryptoceroides* EMERY, 1887; (6) *P. jerdonii* FOREL, 1892; (7) *P. thailandica* sp.n.; (8) *P. wroughtonii* FOREL, 1894.

Mandibles with short, curved hairs near masticatory borders and numerous decumbent hairs arising from pits towards mandibular bases. Anterior clypeal margin with a few, longer, anteriorly directed setae medially and fringe of short setae towards mandibular bases; a few pairs of medium length, erect hairs arising near anterior and basal clypeal margins; numerous decumbent hairs, partly obscuring underlying sculpturation, covering most of clypeus. A few pairs of short, erect hairs on vertex. Medium length, erect hairs lining apical segments of gaster.

Mandibles dark brown with teeth and inner borders dark red and lighter red band along masticatory borders. Body black, with antennae and legs, including coxae, yellowish or light reddish-brown; tarsi and joints of femora and tibiae a shade darker.

**Sexuals and immature stages:** Unknown.

**Remarks:** The holotype specimen was collected foraging low on a tree trunk in dry evergreen forest at the Thong Pha Phum study site within the Maeklong Watershed Research Station. *Polyrhachis thailandica* sp.n. stands closest to *P. jerdonii*, with the main distinguishing characters given in the remarks section under that species.

***Polyrhachis wroughtonii* FOREL, 1894** (Figs. 4, 8, 12)

*Polyrhachis wroughtonii* FOREL, 1894: 398. Syntype workers. Type locality: India, Kanara (M. Wroughton), MHNG (examined).

*Polyrhachis wroughtonii* FOREL, 1895: 457. Description of queen and male.

**Dimensions of syntypes:** TL c. 4.54 - 4.99; HL 1.18 - 1.34; HW 1.03 - 1.15; CI 86 - 87; SL 1.25 - 1.28; SI 111 - 121; PW 1.09 - 1.15; MTL 1.18 - 1.22 (2 workers measured).

**Additional material examined:** India: Travancore, Tenmalai, 500 - 800 m, 11.-17.X.1938 (leg. B.M. - C.M. Exp. to S. India, Sept. - Oct. 1938) (☿); Bombay (no further data) (leg. G.B. King) (☿).

**Dimensions:** TL c. 4.69 - 4.74; HL 1.22 - 1.28; HW 1.04 - 1.09; CI 85; SL 1.25 - 1.34; SI 120 - 123; PW 1.06 - 1.12; MTL 1.15 - 1.22 (2 workers measured).

**Remarks:** *Polyrhachis wroughtonii* is apparently a rather rare species and has been collected on only a few occasions. It is easily distinguished from the other species of the group by the rounded sides of the mesosoma and the absence of a metanotal groove.

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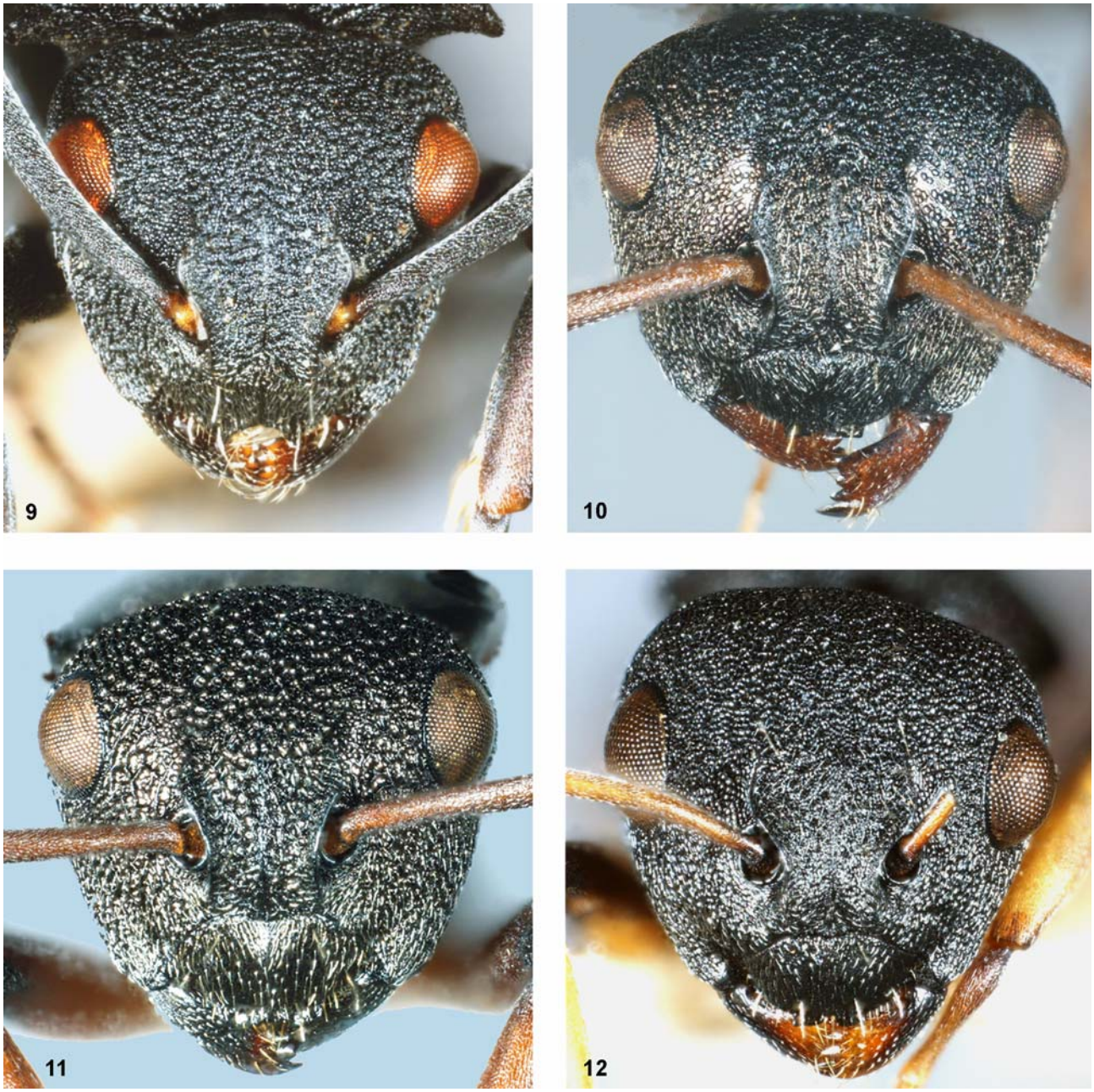


Figs. 9 - 12: Head in full face view; (9) *P. cryptoceroides* EMERY, 1887; (10) *P. jerdonii* FOREL, 1892; (11) *P. thailandica* sp.n.; (12) *P. wroughtonii* FOREL, 1894.

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**Zusammenfassung**

Es wird eine neue Art aus der *Polyrhachis cryptoceroides*-Artengruppe beschrieben, *P. thailandica* sp.n. aus Thailand. Desweiteren wird ein Überblick über alle drei bisher beschriebenen Arten aus der Gruppe gegeben. Ein Bestimmungsschlüssel zu den Arbeiterinnen der Gruppe wird durch Abbildungen der vier Arten illustriert.

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